

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 7,447,290 B2  
APPLICATION NO. : 10/709026  
DATED : November 4, 2008  
INVENTOR(S) : Yuan-Kun Hsiao

Page 1 of 3

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

The title page showing the illustrative figure should be deleted to be replaced with the attached title page.

The drawing sheet, consisting of Fig. 2, should be deleted to be replaced with the drawing sheet, consisting of Fig. 2, as shown on the attached page.

In the Drawings:

On Sheet 2 of 3, in FIG. 2, Box 42, line 1, delete "Filp-flop" and insert -- Flip-flop --, therefor.

On Sheet 2 of 3, in FIG. 2, Box 44, line 1, delete "Filp-flop" and insert -- Flip-flop --, therefor.

In column 2, line 43, after "addition," delete "A" and insert -- a --, therefor.

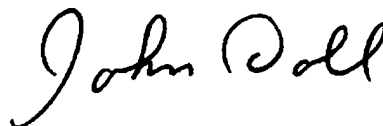
In column 7, line 50, delete "to," and insert -- t0, --, therefor.

In column 8, line 35, delete "t11," and insert -- t15, --, therefor.

In column 9, line 10, delete "PS)" and insert -- P5) --, therefor.

Signed and Sealed this

Tenth Day of March, 2009



JOHN DOLL  
*Acting Director of the United States Patent and Trademark Office*

(12) **United States Patent**  
Hsiao

(10) Patent No.: **US 7,447,290 B2**  
(45) Date of Patent: **Nov. 4, 2008**

(54) **APPARATUS OF PHASE-FREQUENCY DETECTOR**

6,387,417 B2 7/2003 Okamoto  
6,661,752 B2 12/2003 Eom  
6,754,147 B2 6/2004 Hsu

(75) Inventor: Yuan-Kun Hsiao, Taipei Hsien (TW)

(73) Assignee: Tien Holdings, LLC, Wilmington, DE (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 830 days.

(Continued)

**FOREIGN PATENT DOCUMENTS**

CN 1373474 A 10/2002

(21) Appl. No.: 10/709,026

(22) Filed: Apr. 7, 2004

(Continued)

(65) **Prior Publication Data**

US 2005/0025275 A1 Feb. 3, 2005

Primary Examiner—Shuwang Liu  
Assistant Examiner—Hirdepal Singh

(74) Attorney, Agent, or Firm—Perkins Coie LLP

**Related U.S. Application Data**

(60) Provisional application No. 60/461,578, filed on Apr. 10, 2003.

(57) **ABSTRACT**

(51) Int. Cl. H03D 3/24 (2006.01)  
(52) U.S. Cl. 375/375; 375/215; 375/371; 375/376; 327/3; 327/5; 327/7; 327/156; 369/44.13; 369/44.26  
(58) Field of Classification Search 375/326, 375/362, 371, 373, 375-376, 315, 354; 327/113, 327/3, 5, 7, 12, 156; 455/130, 214; 369/44.13, 369/44.26, 44.28, 47, 275.4  
See application file for complete search history.

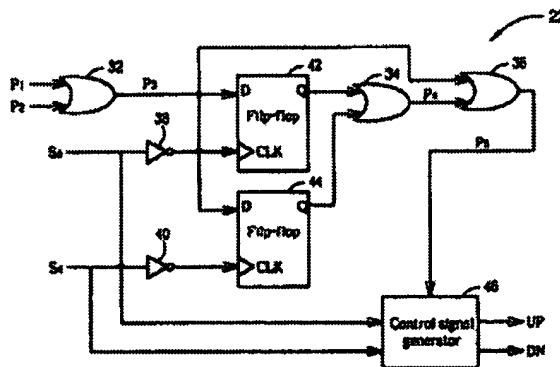
An apparatus of phase-frequency detector for adjusting wobble clock signal and wobble signal in the same phase, comprising: a first logic gate, receiving a first protection signal and a second protection signal and outputting a third protection signal according to a logic operation; a first flip-flop, coupled to the first logic gate, outputting the third protection signal as a first output signal when the wobble clock trigger; a second flip-flop, coupled to the first logic gate, outputting the third protection signal as a second output signal when the wobble signal trigger; a second logic gate, coupled to the first and the second flip-flop, outputting a fourth protection signal according to a logic operation; a third logic gate, coupled to the second logic gate, receiving the third and the fourth protection signal, and outputting a fifth protection signal according to a logic operation; and a control signal generator, receiving the wobble clock, the input signal, and the fifth protection signal and determining whether adjusting the phase of the wobble signal and the wobble clock according to the logic level of the fifth protection signal.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

4,999,824 A 3/1991 Fuji et al.  
5,475,666 A 12/1993 Ito et al.  
5,689,482 A 11/1997 Iida  
6,088,307 A 7/2000 Fushimi et al. 369/44.13  
6,285,219 B1 9/2001 Pauls 327/3  
6,333,902 B1 12/2001 Shim  
6,345,023 B1 2/2002 Fushimi et al.

21 Claims, 3 Drawing Sheets



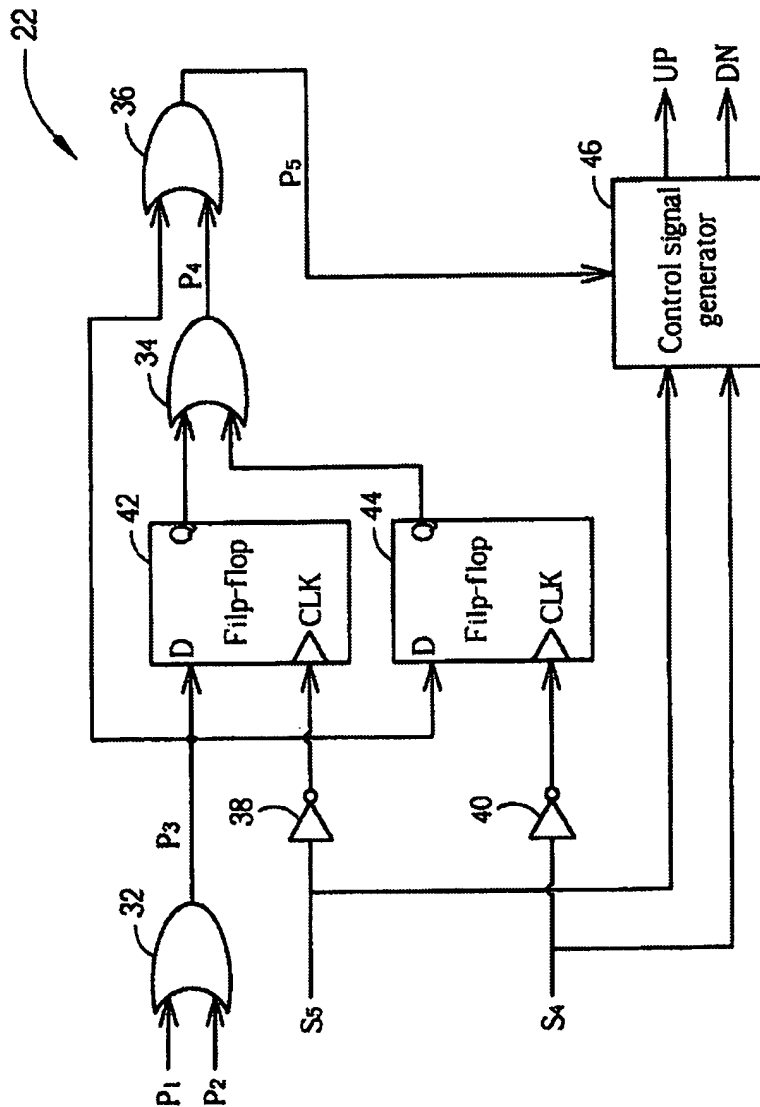


Fig. 2